

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) Apparatus for predicting failure in a system, the apparatus comprising:

a measurement unit for repeatedly measuring a disorder indicator of said system, wherein the disorder indicator represents a non-designated output of said system, the non-designated output represents waste of said system, and

a comparator for comparing obtained measurements of said disorder indicator with a predetermined statistical description of said disorder indicator to determine whether a deviation is present between presently measured values of said disorder indicator and said statistical description, said apparatus being operable to issue a failure prediction upon determination that such a deviation is statistically significant,

wherein said disorder indicator provides non-specific failure indications.

2. (Original) Apparatus according to claim 1, wherein said measurement unit is operable to measure said disorder indicator via a communication link, thereby to monitor remotely located systems.

3. (Withdrawn) Apparatus according to claim 1, further comprising a statistical unit for building up said statistical description of said disorder indicator using measurements taken via said measurement unit during a training phase of operation of said system.

4. (Withdrawn) Apparatus according to claim 1, wherein said statistical description comprises an average and a standard deviation.

5. (Withdrawn) Apparatus according to claim 4, wherein said deviation is considered to be statistically significant when exceeding a threshold of substantially three standard deviations.

6. (Withdrawn) Apparatus according to claim 4, further comprising a deviation thresholder for dynamically setting a threshold deviation level based on said statistical description.

7. (Withdrawn) Apparatus according to claim 1, wherein said disorder indicator is waste heat.

8. (Withdrawn) Apparatus according to claim 1, wherein said disorder indicator is sound.

9. (Withdrawn) Apparatus according to claim 1, wherein said disorder indicator is waste memory.

10. (Withdrawn) Apparatus according to claim 1, wherein said disorder indicator is a proportion of time spent by said system other than on a given task.

11. (Withdrawn) Apparatus according to claim 1, wherein said disorder indicator is a ratio between system load and system resource usage.

12. (Withdrawn) Apparatus according to claim 1, wherein said disorder indicator is a feature having a power law distribution.

13. (Withdrawn) Apparatus according to claim 12, wherein said feature is a distribution of message types in a computer system fault logger.

14. (Withdrawn) Apparatus according to claim 12, wherein said power law distribution comprises a ranking of sub-features of said feature and a deviation is determinable by said comparator from a change in said ranking of said sub-features in said distribution.

15. (Withdrawn) Apparatus according to claim 12, wherein a deviation is determinable by said comparator from a change in overall quantity of said disorder indicator.

16. (Withdrawn) Apparatus according to claim 12, wherein said disorder indicator is a distribution of failure types and said deviation is a deviation from the Zipf-Estoup rule.

17. (Original) Apparatus according to claim 1, further comprising a communication unit for alerting a call center in the event of a failure prediction.

18. (Original) Apparatus according to claim 1, applicable to a system without regard to a level of complexity of said system.

19. (Currently Amended) Apparatus for predicting failure in a system, the apparatus comprising:

a measurement unit for repeatedly measuring a disorder indicator of said system, wherein the disorder indicator represents a non-designated output of said system, and the non-designated output represents waste of said system,

a statistical unit for building up a statistical description of said disorder indicator using measurements taken via said measurement unit during a training phase of operation of said system, and

a system thresholder, for using said statistical description to apply thresholds to said disorder indicator to predict system failure,

wherein said disorder indicator provides non-specific failure indications.

20. (Currently Amended) A method of failure prediction comprising:

repeatedly measuring a disorder indicator of a system, wherein the disorder indicator represents a non-designated output of said system, and the non-designated output represents waste of said system,

comparing said disorder indicator with a statistical description of idealized behavior of said disorder indicator,

determining from said comparison whether a deviation is present in said disorder indicator behavior, and

issuing an alert in the event of determination of such a deviation being of statistical significance,

wherein said disorder indicator provides non-specific failure indications.

21. (Original) Method according to claim 20, wherein said measuring is carried out remotely.

22. (Withdrawn) Method according to claim 20, further comprising building up said statistical description of said disorder indicator using measurements taken via said measurement unit during a calibration period of normal operation of said system.

23. (Withdrawn) Method according to claim 20, wherein said statistical description comprises an average and a standard deviation.

24. (Withdrawn) Method according to claim 23, wherein said deviation present is at least substantially three standard deviations.

25. (Withdrawn) Method according to claim 23, further comprising dynamically setting a threshold deviation level based on said statistical description.

26. (Withdrawn) Method according to claim 20, wherein said disorder indicator is waste heat.

27. (Withdrawn) Method according to claim 20, wherein said disorder indicator is sound.

28. (Withdrawn) Method according to claim 20, wherein said disorder indicator is waste memory.

29. (Withdrawn) Method according to claim 20, wherein said disorder indicator is a proportion of time spent by said system other than on a given task.

30. (Withdrawn) Method according to claim 20, wherein said disorder indicator is a ratio between system load and system resource usage.

31. (Withdrawn) Method according to claim 20, wherein said disorder indicator is a feature having a power law distribution.

32. (Withdrawn) Method according to claim 31, wherein said feature is a distribution of message types in a computer system fault logger.

33. (Withdrawn) Method according to claim 31, wherein said distribution comprises a ranking of sub-features of said feature and a deviation is determinable from a change in said ranking of said sub-features in said distribution.

34. (Withdrawn) Method according to claim 31, wherein a deviation is determinable from a change in overall quantity of said disorder indicator.

35. (Withdrawn) Method according to claim 31, wherein said disorder indicator is a distribution of failure types and said deviation is a deviation from the Zipf-Estoup rule.

36. (Original) Method according to claim 20, further comprising alerting a call center in the event of a failure prediction.

37. (Original) Method according to claim 20, applicable to a system without regard to a level of complexity of said system.

38. (Currently Amended) A method of failure prediction in an operative system, the method comprising:

selecting a measurable indicator of a level of disorder in said operative system, wherein said measurable indicator provides non specific failure indication, and is selected without detailed knowledge of said operative system,

obtaining a statistical description of behavior of said measurable indicator within said operative system,

repeatedly measuring said disorder indicator during operation of said system, wherein the disorder indicator represents a non-designated output of said system,

comparing said disorder indicator with said statistical description,

determining from said comparison whether a deviation is present in said disorder indicator behavior, and

issuing an alert in the event of determination of such a deviation being of statistical significance.

39. (Currently Amended) A data carrier having stored thereon computer executable instructions which when combined with a general purpose computer is operable to provide:

a measurement unit for repeatedly measuring a disorder indicator of an external system, wherein the disorder indicator represents a non-designated output of said system and is a byproduct of operation of said system, and

a comparator for comparing obtained measurements of said disorder indicator with a predetermined statistical description of said disorder indicator to determine whether a deviation is present between presently measured values of said disorder indicator and said statistical description, said combination being operable to issue a failure prediction upon determination that such a deviation is statistically significant.

40. (Currently Amended) Apparatus for measuring quality of software operating in a system, the apparatus comprising:

a measurement unit for repeatedly measuring a disorder indicator of said system, wherein the disorder indicator represents a non-designated output of said system, and the non-designated output represents waste of said system, and

a comparator for comparing obtained measurements of said disorder indicator with a predetermined statistical description of said disorder indicator to determine whether a deviation is present between presently measured values of said disorder indicator and said statistical description, said apparatus being operable to issue a quality score of said software based on an extent of said deviation,

wherein said disorder indicator gives statically viable but non-specific failure indications.

41. (New) A method for predicting failure in a computing system based on a top down approach, the method comprising:

automatically determining a disorder indicator representing waste that said computing system produces;

repeatedly measuring the disorder indicator of said system;

comparing obtained measurements of said disorder indicator with a predetermined statistical description of said disorder indicator to determine whether a deviation is present between presently measured values of said disorder indicator and said statistical description, wherein said disorder indicator predicts faults that are a result of ill-defined or unexpected phenomena; and

issuing a failure prediction upon determination that such a deviation is statistically significant.

42. (New) The method according to claim 41, wherein said disorder indicator is determined without any detailed knowledge of said system.

43. (New) The method according to claim 42, wherein said disorder indicator is determined without any detailed knowledge of operation of said system.

44. (New) The method according to claim 43, wherein said disorder indicator is determined without any detailed knowledge of failure modes of said system.

45. (New) The method according to claim 41, wherein said automatically determining a disorder indicator comprises: observing the system for patterns in a behavior of said system that are indicative of faults;

46. (New) The method according to claim 41, wherein said system is a customized computing system.

47. (New) The method according to claim 41, wherein measuring said disorder indicator comprises measuring a number of failure messages, and wherein the deviation is present when an overall number of messages statistically significantly increases.

48. (New) The method according to claim 41, wherein measuring said disorder indicator comprises measuring a number of logged faults, and wherein the measure number of logged faults are compared with an average distribution of the logged faults.

49. (New) The method according to claim 41, wherein measuring said disorder indicator comprises measuring heat produced by said system and an overall load of said system, wherein for said comparison said measurement of said produced heat is adjusted based on said measurement of said overall load of said system.

50. (New) The method according to claim 41, wherein measuring said disorder indicator comprises measuring internal system load produced by a central processing unit and an external system load produced by a messaging signaling units, wherein for said comparison said measurement of said produced internal system load is adjusted based on said measurement of said external load of said system.

51. (New) The method according to claim 41, wherein measuring said disorder indicator comprises measuring amount of time a system resource is devoted to a particular task.

52. (New) The method according to claim 41, wherein said system is a local area network system, and wherein in predicting failures said system uses said indicator in a top down approach.